

Vegetation and Flora of the Swan River Oxbow Preserve

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The preserve is located along the east side of the Swan River approximately two miles south of where it empties into Swan Lake. Most of the preserve is on the delta which has been formed by the river upon entering the lake. Although the river channel appears to be stable, flooding of the slough, the marshy areas surrounding it and much of the lower ground at the west end of the preserve occurs each spring during high water. Groundwater levels on the east end are high throughout the year. Many springs and seeps are present, and much of the area has standing water during the majority of the growing season. Two of the most important factors controlling the vegetation patterning on the preserve are the high groundwater table and periodic flooding by the river.

Forests on the west end of the preserve near the river are dominated by cottonwood. Spruce is a common component of these cottonwood forests, and spruce reproduction appears to be more common than cottonwood reproduction. Although cottonwood forest might be considered successional to spruce forest, the disturbance resulting from periodic flooding probably promotes the continued existence of the cottonwoods in these low areas. The high water table at the east end of the preserve is evidenced by the presence of numerous springs and seeps. The slightly higher areas around these springs and seeps is dominated by spruce forest. Just north of the spruce forest the action of beavers along Spring Creek has resulted in wetter, usually innundated terrain underlain by organic soils and occupied by fen-carr vegetation. Shrubby carr vegetation usually occurs adjacent to the spruce forest in areas of slightly better aerated soils than the fen. Small spruce trees are common in the carr vegetation, but rooting is shallow, and the wet soils provide poor support, so few trees reach heights greater than the shrubs before they become uprooted. Fen and carr vegetation interfinger in a complicated small-scale fashion, thus these two vegetation types are mapped as one unit. As one moves west away from Spring Creek, the vegetation is less affected by groundwater and more affected by spring flooding of the river. Low areas at the west end of the preserve are flooded early in the year but dry out later in the summer. The yearly drying of these areas prevents the formation of organic soils and results in the presence of marsh vegetation instead of fen-carr.

The following descriptions of the vegetation and flora of the Swan River Oxbow Preserve are the result of approximately 30 hours of reconnaissance carried out on May 21, June 3-4, July 21-22, and July 25, 1986. The species inventory and descriptions of the vegetation apply to only that part of the Edge property north of the Porcupine Creek Road. The study area is large and diverse. Not all of the study area was surveyed during each visit, thus the species inventory cannot be considered exhaustive.

REPORT TO THE NATURE CONSERVANCY

Cottonwood Forest

Mature cottonwood forest is the predominant vegetation in the western half of the preserve. Soils are sandy to loamy and moist throughout much of the growing season. Spring flooding occurs in some areas. The dominant canopy tree is black cottonwood (Populus trichocarpa). Spruce (Picea engelmannii) and paper birch (Betula papyifera) are also common, but together they compose less than 50% of the canopy. Common shrubs in the understory include alder buckthorn (Rhamnus alnifolia), thinleaf alder (Alnus incana), snowberry (Symphoricarpos albus), Oregon grape (Berberis repens) and dogwood (Cornus stolonifera). Shrub cover is very dense beneath open cottonwood canopies and quite light in areas dominated by spruce. Common herbaceous understory species are wild sarsaparilla (Aralia nudicaulis), dwarf bramble (Rubus pubescens), lady fern (Athyrium filix-femina) and Canada violet (Viola canadensis). Herbaceous cover is generally high throughout this forest type.

Spruce Forest

Wet spruce forests are found at the west end of the preserve. Soils are loamy and moist to wet with a high organic matter content. In wetter areas the forest floor displays a microtopography consisting of raised areas around the bases of trees and depressions, often filled with water into early summer, between the raised areas. The dominant tree is spruce. Small numbers of paper birch, Douglas fir (Pseudotsuga menziesii), lodgepole pine (Pinus contorta) and white pine (P. monticola) can be found. I observed many small seedlings of red cedar (Thuja plicata) but saw no mature trees. Alder buckthorn and Oregon grape are common understory shrubs. The herbaceous ground layer is dense and diverse. Common species include lady fern, wild sarsaparilla, dwarf bramble and oak fern (Gymnocarpium dryopteris).

This community type and the preceeding one correspond to the Picea/Equisetum arvense habitat type of Pfister et al. (1977, Forest habitat types of Montana). They state that this type is rare in Montana as a whole but is locally common in the Flathead Valley. These communities generally occur on broad alluvial valley bottoms, areas which are subject to disturbance or destruction from timber harvest activities, livestock grazing, recreational and residential development, and hydroelectric development. Large undisturbed tracts of these communities are rare in northwestern Montana and should probably be considered threatened.

Birch Carr

Areas along the east margin of the cottonwood forest and along the north margin of the spruce forest display mire vegetation dominated by shrubs. Soils are organic and innundated or wet throughout the growing season. Carr vegetation is dominated by bog birch (Betula glandulosa). Bebb willow (Salix bebbiana), tea-leaved willow (Salix planifolia), dogwood, thinleaf alder and alder buckthorn are other common shrubs. Small spruce trees are scattered throughout the carr but apparently are not able to reach normal stature. Common herbaceous species include skunk cabbage (Lysichitum americanum), horsetail (Equisetum arvense), arrowleaf groundsel (Senecio triangularis), coltsfoot (Petasites sagittatus) and beaked sedge, (Carex rostrata).

Sedge Fen

Mire vegetation dominated by sedges is found associated with the carr vegetation, and many species are common to both types. Soils are organic and flooded throughout all or most of the growing season. Fen vegetation is dominated by beaked sedge, lesser panicled sedge (Carex diandra), inland sedge (C. interior) and slender sedge (C. lasiocarpa). Common forbs include water horsetail (Equisetum fluviatile), marsh cinquefoil (Potentilla palustris), water-parsnip (Sium suave) and coltsfoot. Mountain willow (Salix monticola) and hoary willow (S. candida) are also present but not abundant.

Marsh

Much of the northwest end of the preserve which includes old shallow sloughs of the Swan River is occupied by coarse sedges and grasses. Soils are silty and flooded throughout most of the growing season; however, drying and decomposition of organic matter does occur in most marsh areas in late summer and fall. Vegetation is dominated by canarygrass (Phalaris arundinacea), awned sedge (C. atherodes), inflated sedge (C. vesicaria) and beaked sedge. Common forbs include small-flowered forget-me-not, (Myosotis laxa), grass-leaved pondweed (Potamogeton gramineus), water horsetail and water-parsnip. Cattail (Typha latifolia) is common in some areas. The question of whether canarygrass is an exotic is open to debate, but it appears to be rather aggressive in the study area and may be replacing other components of the marsh community.

Aquatic

Open water lacustrine habitat is found in the large oxbow slough at the west end of the preserve and in the beaver ponds along Spring Creek. Common species include yellow water-lily (Nuphar variegatum), water-milfoil, (Myriophyllum spicatum), mare's-tail (Hippuris vulgaris) and pondweeds (Potamogeton richardsonii, P. gramineus and P. natans). The aquatic community merges into the marsh community as the water becomes shallower.

Calcareous Spring Meadow

This distinctive community occupies only a small area around the springs at the head of Spring Creek at the extreme east end of the preserve. Soils are gravelly and wet throughout the growing season with little fluctuation in water table. Vegetation in this community is sparse and dominated by yellow sedge (Carex flava) and green sedge (C. oederi). Characteristic forbs include Kalm's lobelia (Lobelia kalmii) and few-flowered spike-rush, (Eleocharis pauciflora). The grass, redtop (Agrostis alba) is also common.

This community type is generally found along calcareous shores and in calcareous fens. Similar communities are known from Dudley Slough, Lincoln Co., Elk Meadows, Missoula Co., and Pine Butte Fen, Teton Co. This community type is probably rare in Montana.

Rare Plants

Howellia aquatilis Gray. Howellia. G2-S1. Howellia is an annual aquatic plant found in sylvan ponds which dry up before the end of the growing season. Historically, howellia is known from one station in northern California, two stations in Oregon, three stations in Washington, one station in northern Idaho and three stations in the Swan Valley of northwestern Montana. It is currently known to be extant only in Washington and Montana. Howellia is listed as extinct in California and endangered in Oregon, Washington and Montana. In the Swan River Oxbow Preserve, howellia occurs in at least three marshy areas adjacent to the large oxbow slough at the western end. In 1985 the population was estimated to be 5,000-10,000 plants. In 1986 the number of plants observed was much smaller, perhaps fewer than 100 plants. Large fluctuations in the population size of annual plants are not uncommon, and since at least 10-20 acres of potential habitat exist on the preserve, it is believed that the population is a long-term viable one (see Appendix A).

Potamogeton obtusifolius Mertens & Koch. Blunt-leaved pondweed. G4-S2. This species of pondweed is found in ponds and streams in the northeastern U.S. and adjacent Canada. It is apparently disjunct in northwestern Montana where it is currently known from at least five stations in Flathead, Glacier and Lake counties. On the Swan Oxbow Preserve, P. obtusifolius has been found in the west end of the oxbow slough. A population estimate cannot be made without putting a boat on the slough.

Comandra livida Richards. (= Geocaulon lividum (Richards.) Fern.). Northern bastard toadflax. G4-S2. This species is found from Alaska south to northeastern Washington, northern Idaho and northwestern Montana. In Montana it is known from approximately five stations in Lake, Flathead and Lincoln counties. It was listed as recommended for threatened status by the Montana Rare Plant Project, but it appears to be more common in the state than was once believed. On the Swan Oxbow Preserve C. livida has been found in the spruce forests at the east end, especially around the springs. Comandra is rhizomatous, making population estimates difficult. At least fifty stems in three separate areas have been observed, and thorough searching would undoubtedly result in the discovery of more.

Dryopteris cristata (L.) Gray. Buckler-fern. G4-S2. This species is circumboreal in distribution, occurring south in the Rocky Mountains to northern Idaho and northwestern Montana. Buckler-fern is listed as state threatened in Idaho, sensitive in Washington and rare in Montana. It is also listed as threatened or rare throughout much of its range in eastern North America (Steele et al., 1981, Vascular plants of concern in Idaho). In Montana this species is currently known from approximately five stations in Lake, Flathead and Missoula counties. On the Swan Oxbow Preserve, D. cristata was observed growing under shrubs in the carr and moist spruce forest in the center of the preserve. From 10-40 acres of potential habitat exists on the preserve. The entire area was not surveyed; however, it is likely that there is a population of at least fifty plants.

Viola septentrionalis Greene. Northern violet. G4-S1. This species is found in eastern North America and in British Columbia. A violet that seems to fit the description of V. septentrionalis was discovered in the cottonwood-spruce forest at the northwest end of the Swan Oxbow Preserve in 1986. A similar plant has been collected by Klaus Lackschewitz near Condon at the south end of the Swan Valley. A positive identification of this plant will have to await determination by an expert familiar with the genus. This violet appeared to be common in the area at the northwest corner of the preserve which was surveyed in early spring when the plant is easily identifiable.

Cypripedium calceolus L. var. parviflorum (Salisb.) Fern.
(= C. parviflorum salisb.). Yellow lady's-slipper. G3T2-S2.
Cypripedium calceolus (sensu lato) is found throughout
northeastern U.S. and adjacent Canada, from British Columbia
south to Utah and Colorado, and in Europe. The variety
parviflorum is found in the western part of the species' range in
North America. Yellow lady's-slipper is listed as endangered in
Oregon and Idaho and threatened in Washington. It is known from
at least ten locations in western Montana. A small population of
approximately 50 plants occurs on Forest Service land just
east of the big spring in an area ecotonal between fen and spruce
forest.

Exotics

Many species of Eurasian exotics have become established
along the roads and in cutover areas bordering the preserve, but
few have become established in the relatively undisturbed
vegetation of the preserve itself. A few species of Eurasian
meadow grasses and forbs are present in the area around the ruins
of the old cabin just north of the main Forest Service road near
the west end of the preserve. These weeds will most likely
disappear as the forest reestablishes itself in the cleared area.
Only two species of exotics appear to pose a potentially serious
threat to the pristine nature of the preserve:

Canarygrass (Phalaris arundinacea) is considered by some to be an
exotic; however, Hitchcock (1951, Manual of the grasses of the
United States) does not consider it to be introduced, and
Hitchcock et al. (1969, Vascular plants of the Pacific Northwest,
Part 1) are uncertain of its origin. Regardless of its origin,
this plant has come to dominate large areas of the wet meadows
and marshy areas both north of the preserve and on the preserve
itself. Its behavior should be monitored as it is capable of
forming almost monospecific stands and may be capable of altering
the marshy areas around the slough and making them uninhabitable
for Howellia aquatilis.

Canada thistle (Cirsium arvense) has become established on the
natural levee along the east bank of the Swan River and in parts
of the fen around the main spring at the head of Spring Creek.
This species spreads by rhizomes and is very aggressive. It
probably is incapable of becoming established in either forested
areas or wetlands, but it has the potential for increasing in
ecotonal areas.

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Vascular Plant Species Observed at the Swan Oxbow Preserve

Aceraceae

Acer glabrum

Alismataceae

Alisma plantago-aquatica

Sagittaria cuneata

Apiaceae

Angelica arguta

Cicuta douglasii

Heracleum lanatum

Osmorhiza chilensis

Sanicula marilandica

Sium suave

Araceae

Lysichitum americanum

Araliaceae

Aralia nudicaulis

Asteraceae

Achillea millefolium

Anaphalis margaritacea

Arnica chamissonis

Artemisia ludoviciana

Aster junciformis

Aster laevis

Aster occidentalis

*Centaurea maculosa**

*Chrysanthemum leucanthemum**

*Cirsium arvense**

*Cirsium vulgare**

*Filago arvensis**

Petasites sagittatus

Senecio pseud aureus

Senecio triangularis

Solidago canadensis

*Taraxacum officinale**

Berberidaceae

Berberis repens

Betulaceae

Alnus incana

Betula glandulosa

Betula papyifera

Boraginaceae

*Cynoglossum officinale**

Myosotis laxa

Brassicaceae

Barbarea orthoceras

Cardamine pensylvanica

Callitrichaceae

Callitriche heterophylla

Campanulaceae

Howellia aquatilis

Lobelia kalmii

Caprifoliaceae

Linnaea borealis

Symphoricarpos albus

Caryophyllaceae

Stellaria longifolia

Cornaceae

Cornus canadensis

Cornus stolonifera

Cupressaceae

Juniperus communis

Juniperus occidentalis

Thuja plicata

Cyperaceae

Carex aperta

Carex atherodes

Carex aurea

Carex bebbii

Carex buxbaumii

Carex capillaris

Carex dioica

Carex disperma

Carex douglasii

Carex flava

Carex geyeri

Carex interior

Carex lanuginosa

Carex lasiocarpa

Carex lenticularis

Carex leptalea

<p>Cyperaceae (cont.)</p> <p>Carex microptera Carex muricata Carex retrosa Carex rossii Carex rostrata Carex stipata Carex vesicaria Carex vulpinoidea Eleocharis acicularis Eleocharis palustris Eleocharis pauciflora Eriophorum polystachion Scirpus microcarpus</p>	<p>Iridaceae</p> <p>Sisyrinchium angustifolium</p>
<p>Elaeagnaceae</p> <p>Shepherdia canadensis</p>	<p>Juncaceae</p> <p>Juncus alpinus Juncus bufonius Juncus ensifolius Juncus longistylis Juncus nodosus Juncus tenuis</p>
<p>Equisetaceae</p> <p>Equisetum arvense Equisetum fluviatile Equisetum scirpoidea</p>	<p>Lamiaceae</p> <p>Lycopus uniflorus Mentha arvensis Physostegia parviflora Prunella vulgaris Scutellaria galericulata</p>
<p>Ericaceae</p> <p>Chimaphila umbellata Menziesia ferruginea Pyrola asarifolia Pyrola minor Pyrola secunda Pyrola uniflora Vaccinium caespitosum Vaccinium membranaceum</p>	<p>Lemnaceae</p> <p>Lemna minor</p>
<p>Fabaceae</p> <p>Lathyrus ochroleucus Trifolium agrarium* Vicia americana</p>	<p>Lentibulariaceae</p> <p>Utricularia vulgaris</p>
<p>Grossulariaceae</p> <p>Ribes lacustre Ribes setosum</p>	<p>Liliaceae</p> <p>Clintonia uniflora Disporum trachycarpum Smilacina stellata Streptopus amplexifolius Trillium ovatum Veratrum viride Zygadenus elegans</p>
<p>Haloragaceae</p> <p>Myriophyllum spicatum</p>	<p>Lycopodiaceae</p> <p>Lycopodium annotinum</p>
<p>Hippuridaceae</p> <p>Hippuris vulgaris</p>	<p>Menyanthaceae</p> <p>Menyanthes trifoliata</p>
<p>Hypericaceae</p> <p>Hypericum formosum Hypericum perforatum*</p>	<p>Nymphaeaceae</p> <p>Nuphar variegatum</p>
	<p>Onagraceae</p> <p>Circaea alpina Epilobium angustifolium Epilobium glaberrimum Epilobium palustre Epilobium watsonii</p>

Ophioglossaceae

Botrychium multifidum
Botrychium virginianum

Orchidaceae

Corallorhiza maculata
Cypripedium calceolus
Goodyera oblongifolia
Habenaria dilatata
Habenaria hyperborea
Listera caurina
Listera convallarioides

Pinaceae

Larix occidentalis
Picea engelmannii
Pinus contorta
Pinus monticola
Psedotsuga menziesii

Plantaginaceae

Plantago major*

Poaceae

Agropyron repens*
Agrostis alba
Agrostis exarata
Alopecurus aequalis
Alopecurus pratensis
Beckmania syzigachne
Bromus ciliata
Calamagrostis canadensis
Calamagrostis inexpansa
Deschampsia cespitosa
Elymus glaucus
Glyceria borealis
Glyceria striata
Glyceria grandis
Phalaris arundinacea
Poa pratensis*
Trisetum cernuum

Polemoniaceae

Polemonium occidentale

Polygonaceae

Rumex crispus

Polypodiaceae

Athyrium filix-femina
Cystopteris fragilis
Dryopteris cristata
Dryopteris filix-mas
Gymnocarpium dryopteris
Pteridium aquilinum

Potamogetonaceae

Potamogeton gramineus
Potamogeton natans
Potamogeton obtusifolius
Potamogeton pectinatus
Potamogeton richardsonii

Primulaceae

Dodecatheon pulchellum
Lysimachia thrysiflora

Ranunculaceae

Actaea rubra
Clematis columbiana
Ranunculus aquatilis
Ranunculus flamula
Ranunculus gmelinii
Ranunculus macounii
Ranunculus uncinatus
Thalictrum occidentale

Rhamnaceae

Rhamnus alnifolia
Rhamnus purshiana

Rosaceae

Amelanchier alnifolia
Crataegus douglasii
Fragaria virginiana
Geum macrophyllum
Geum rivale
Potentilla palustris
Prunus virginiana
Rosa nutkana
Rosa woodsii
Rubus idaeus
Rubus parviflorus
Rubus pubescens
Spiraea betulifolia

Rubiaceae

Galium triflorum
Galium trifidum

Salicaceae

Populus trichocarpa
Salix bebbiana
Salix candida
Salix exigua
Salix geyeriana
Salix monticola
Salix myrtifolia
Salix phylllicifolia
Salix rigida
Salix sitchensis

Santalaceae

Comandra livida

Saxifragaceae

Mitella nuda
Tiarella trifoliata

Scrophulariaceae

Melampyrum lineare
Mimulus guttatus
Mimulus moschatus
Veronica americana
Veronica catenata

Solanaceae

Solanum dulcamara*

Sparganiaceae

Sparganium emersum
Sparganium minimum

Typhaceae

Typha latifolia

Valerianaceae

Valeriana occidentalis

Violaceae

Viola adunca
Viola canadensis
Viola glabella
Viola nephrophylla
Viola septentrionalis (?)

FC Fen-carr (complex
of fen and carr
communities)

